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ON THE SKULL OF DANTE.

A Letter from HERMANN WELCKER, Professor of Anatomy, Halle, Hon. Fellow A.S.L., Corr. Memb. E.S.L., to Dr. J. BARNARD DAVIS.

MY MOST ESTEEMED FRIEND,—

The following inquiry, which I have the pleasure to address to you, is founded not only on the death-mask of Dante, and that important, interesting, and full Report,* which the Commissioners for the identification of the recently discovered remains of Dante have published, but also on a treatise of the excellent anthropologist Nicolucci, in many points based upon this Report.† A third publication, issued in the meanwhile, I did not become acquainted with until you informed me of it.‡

The question of the *authenticity* of the bones found in the chest of the Fratri Minori, I shall not enter into the probability of, or into the arguments by which it is sustained, which are derived from the history of Dante's interment, the first renovation of his tomb, and the finding of the chest. This is a subject already sufficiently examined into by those entrusted with the inquiry, and it has been copiously treated on. For my part, so far as I am able to survey the circumstances, I do not doubt the authenticity of the bones produced to be the remains of Dante, and believe that in this letter I shall bring forward new grounds in support of this authenticity. All that I know speaks for the same, nothing against it. But it cannot be denied that the authenticity of the contents of the chest found at Braccioforte, notwithstanding the inscription thereon in distinct characters, might be doubted. The ashes of Dante have in the course of centuries experienced so many vicissitudes; they have, as it is said, after repeated interments, been saved by flight and hidden in an unknown place, then been suddenly found again by a peculiar accident. The circumstances and the moment of this re-discovery might excite distrust in those inclined to doubt. They came to light opportunely, during the preparations for the celebration of the six hundredth year jubilee of the poet, in the ecstasy of the Italian people, who could not regard the bones of their

* *Relazione della Commissione Governativa eletta a verificare il fatto del ritrovamento delle ossa di Dante in Ravenna.* Firenze: 1865. 4to.

† *Il Cranio di Dante Alighieri*; Lettera del Cav. Dr. Giustiniano Nicolucci, all' illustre Antropologo, Sig. Dr. F. Pruner-Bey, Parigi. 1866.

‡ *Intorno al Cranio di Dante Alighieri*; Nota Antropologica diretta al Preside della R. Accademia di Science, Lettere ed Arti in Modena, da Paoli Gaddi. 1866. 4to.

greatest poet, the combatant at Campaldino and Caprona, the leading champion of the white party exiled by the black, to have been scattered to the four winds—they appeared, as it may be said, quite *à propos*. Might not, if we do not admit an intentional substitution, an undesigned change of the bones have taken place in the flight? However much all things plead for the honest purpose of the Frati Santi, still I believe that as thorough an examination as possible, based on anatomical conditions, will only be welcome to the friends of Dante.

1. The “Relazione” or Report justly lays great stress upon the question of the agreement of Dante’s mask and the skull found in the chest; and it is stated at p. 17, that the comparison of the two has afforded the same character in the conformation of the forehead, the same form of the arches of the eyebrows, of the bridge of the nose, and the same length and shape of the nasal bones. But, if the skull and the death-mask belong to one another, they must show, not only corresponding *forms*, but also corresponding *proportions*. The dimensions of the mask must be everywhere *larger*, certainly in various proportions; since the soft parts covering the bones in different divisions of the face are of different thicknesses. Yet, everywhere the measures of the mask will be greater; *smaller dimensions cannot be expected*. The measurements of the mask do not occur in the “Report”; on the other hand, there are specified (p. 17) a number of dimensions which were taken from the skull found in the chest. Let us compare them with those which I have obtained from the mask.

a. The perpendicular distance from the root of the nose to the lower extremity of the connection of the two superior maxillary bones, consequently to the roots of the inner incisor teeth, *i.e.* to the middle of the upper lip. In the skull, according to the statement of the “Report”, this is 85 *millimètres*. In the mask I find the distance between the two points named, which cannot be easily missed, to be at most 66 *mm*. The dimension taken from the skull is consequently much *too large* for the mask. The callipers, when opened to the extent of 85 *mm*. and one limb placed on the root of the nose, reach down a finger’s breadth below the mouth.*

b. The transverse measure through the middle region of the cheek-

* Professor Welcker’s letter was accompanied with two outline tracings of the profile of the mask of Dante, taken by the profile apparatus described in his *Kraniologisches Mittheilungen*, p. 101. One of these sketches is of the size of the mask, where it is seen, by a line introduced for the purpose, that the distance in question is 66 *millimètres*. The other is a magnified or colossal profile, made sufficiently large to allow of the distance defined to extend to 85 *mm*. In this way the incongruity of the latter measure of the *Relazione* is rendered more conspicuous.—ED.

bones. In the cranium, 107 mm.; in the mask, 115 mm. This is an increase which may very well be dependent on the soft parts of this region of the face.

c. The transverse measure between the middle of the two jugal arches. In the skull, 135 mm.; in the mask, 134 mm. at the most. The compasses opened to 135 mm. allow the whole jugal region, in all places to come between them without touching.

d. The distance from the outer edge of the orbit on one side to that of the other. On the skull, according to the "Relazione", 124 mm.; upon the mask, I find it to be only 106 mm. The callipers opened to 124 mm. and placed on the transverse line intersecting the orbits, reach much farther backwards, to the surface of the temples.*

Other dimensions of the skull given in the "Report" (especially those of the proper brain-skull) are but little fitted for comparison with the measurements of the mask. I believe I may assert, as the result of our comparison, that *either the mask is not genuine, at least it is not the death-mask of Dante, or the measures of the "Report" are not the measures of Dante's skull.*

This result leads us, first of all, to a closer examination of the *mask*. The "Relazione" appears to hold it to be genuine; and, although this is not explicitly asserted, there is no intimation that the authenticity of the mask is doubtful.† It is always called a mask ("maschera") whereby, according to the usage of the Italian language, is understood a *death-mask*, not a free imitation. It is so much like the best and most assured portraits of Dante, that, if it be a death-mask, there can be no doubt it is the death-mask of Dante. The copy used by myself I owe to the kindness of our renowned Dante-man, my colleague Witte, who obtained it from the atelier of Rauch, and warrants that it is identical with the Torregianian example.

I have never been able to think this modelled head was a mere and unaltered death-mask. The same hand that modelled the portion of a cap in the manner of a diadem rising upwards, may also have employed some art touches here and there upon the face, to dissipate the expression of death, and give the whole an appearance of life. Indeed, there are many points to be recognised in this mask, which remind

* It must be allowed that, with respect to this measure especially, a mistake on the mask is not very likely; for it concerns the narrow border of bone lying close under the skin, which limits the outer edge of the orbit. It is quite clear that for the mask of Dante the dimension of 106 mm. is too small, and that of 124 mm. far too large.

† It is introduced in the Report (p. 17) by the words "La maschera di Dante, che dicesi tolta dal cadavere, ora posseduta della R. Galleria di Firenze per legato del marchesa Torregiani"; and by Nicolucci it is said, "La maschera tolta dal suo cadavere", p. 8.

us more of the proceedings of art and the technicalities of modelling than of the mere cast of a dead head. On the other hand, I consider that in the neighbourhood of the eyes, at the corners of the mouth, and in some other places, I can perceive marks such as are to be seen in real death-masks; so that I must suppose that the mask, so far as it is not the mere impression of the real head, has had the actual death-mask for its original ground.*

I am, however, of opinion that this point ought to be most carefully investigated. Against the supposition that the Torregianian head is a death-mask, it might probably be of moment that it reminds one more of the profile portrait of the youthful Dante (28—30 years) originating from Giotto than of Raphael's picture of the older man; whilst we should have expected the reverse, that the death-mask would represent the features of the pictures taken in later years. Still, there is no ground for assuming that Raphael collated this with any authentic portrait, it is much more probable that he only relied on the traditional likenesses of the manuscripts of the *Divine Comedy*. So we might suppose that the original of the "mask" was a Dante at a period of life between Giotto's and Raphael's portraits, and that the "death-mask" was nothing more than a likeness made in Dante's lifetime. There is another question after all—its answer in the *negative* would totally alter the state of the whole matter—were death-masks usually taken six hundred years ago? Upon this antiquarian point I am not informed, and shall content myself with having raised the question. The oldest death-masks I recollect are of a later time, those of Luther and of Tasso.

Let us, however, suppose for a moment that the mask is really a death-mask, although artistically restored, we should then not expect to find it cut away, diminished; but the reverse, deeply depressed places filled out, and here and there parts of the face enlarged. But it is quite the contrary. The jugal breadth (*c.* of our previous explanation) is in the mask *less* than the corresponding dimension of the bare skull; and the measures mentioned under *a.* and *d.* (length of the upper face, and breadth in the orbital region) are in the skull so exceedingly much larger, that we must assume the mask to be, if genuine, still to be a reduction of the natural size. But, how could it be that the mask could be copied from Dante's face other than the

* It is evident that Goethe did not regard a certain head of Dante to be the poet's death-mask (Eckermann's *Gesprächen*, i, p. 170), for he says: "It is well done—he is already old, bent, peevish, with the features relaxed and sunk, as if he had just come from hell." These expressions weigh but little against the supposition of our mask being a death-mask, as it is not clear whether Goethe had the Torregianian mask before him. Eckermann speaks of a "colossale Büste", a "colossaler Bild".

natural size? On the other hand, the measure mentioned under *b*. must also be equally diminished; yet in this diameter the mask is larger than the skull.

Let us submit the *measures of the skull* to a critical examination. The measurement given in the "Relazione" for the breadth of the orbital region, 124 *millimètres*, appears to me under all circumstances to be too great, whether I take into consideration the portraits of Dante which lie before me, or whether I make use of the general results of craniometry as a standard. The highest cypher which I have obtained for the dimension in question (linea *zz*. of my system of measurements), out of two hundred and thirty-seven skulls of German men, is 112 *mm*. Twice I found the next highest figure to be 110. The average was 99 *mm*. Out of twenty-seven skulls of Italian men I obtained a mean of 97 *mm*. In Schiller, whose skull is of a rare size, and at the same time has an uncommon breadth, the cypher in question is 106. For the skull of Dante, a man of middle stature,* whose head was well proportioned to his body, and whose countenance, according to all the portraits, was of a rather narrow oval form,† 124 *millimètres* is an absolutely impossible measure. Open a pair of callipers to 124 *millimètres*, and seek to find amongst thousands of skulls an example, the orbital diameter of which will reach that breadth;‡ or model a bust of Dante, taking that foundation for the dimensions of the diameter of the orbital region of the skull and of the upper face, and a colossal bust would be obtained.

I am not able to explain the contradiction which exists between the specified measures of the mask and the skull. If the words, "la distanza della parte esterna della periferia della base orbitaria d'un lato fino al punto identico dell'orbita della parte opposta" should be understood not to be the line uniting the two outer edges of the orbits (as my line *zz*.); but should the outer surfaces of the frontal

* "Una statura media dell' uomo."—*Relazione*, p. 15.

† "Il suo volto fu lungo."—Boccaccio, *Vita di Dante*, p. 54.

‡ In the table I have given of remarkably large skulls (*Untersuchungen über Wachstum und Bau*, u. s. w., S. 136), the skull of the "Marburger Reisen", with the enormous horizontal circumference of 592 *mm*., certainly has an orbital breadth of 125 *mm*. The cranium of Professor Arnoldi (horizontal circumference 569 *mm*.) has 111 *mm*. All the other skulls of that table have less than 111 *mm*. I am now able to add, that in the Neanderthal skull, described by yourself, with a horizontal circumference of 581 *mm*., which I take to be the skull of a giant, the line *zz* amounts to 114 *mm*. In the Neanderthal itself it is 116 *mm*. In no single normal skull of any race have I found the dimension in question greater than 112 *mm*. The horizontal circumference of Dante's skull amounts, according to the *Relazione*, only to 525 *mm*.; this is a size at which the corresponding orbital breadth is usually from 98 to 104 *mm*.

processes of the jugal bones be regarded as the points of measurement, yet these unusual measurements certainly would turn out only 4 to 10 *millimètres* more than the transverse line *zz.* of the same skull. Even in Schiller's cranium,—such an orbital breadth taken from the outsides of the orbits, is only 116 *millimètres*. I should assume for this cypher “124” the occurrence of some accident, as an error of the press, if I did not find the same difficulty again in the dimension of the upper face (compare as before). 85 *millimètres* for this line is an extraordinarily large measure, such as could only be met with in quite particular, abnormally large skulls. It is in the highest degree to be regretted that the members of the Commission were not allowed to have a mould of the skull taken. To produce a cast from such mould, or only a good drawing of the skull, would have been of more validity than the best that I am able to say upon the matter.

Let us pass on to another character equally found in the mask and the skull, which, in spite of the contradictions just named, falls into the scale weightily for the authenticity of the skull found in the chest.

The “*Relazione*” mentions at page 16 the occurrence of an *asymmetry* in the skull discovered in the chest. And although the text in this place only says the skull appeared “somewhat unsymmetrical,” since the left parietal protuberance was more prominent than the right, and, at the same time, “placed a little further backwards,” there cannot be a doubt that a more considerable degree of *asymmetry* existed in this part than those smaller defects of symmetry which are only perceptible by careful comparison, and from which scarcely any skull is free. It certainly was not the intention of the “*Relazione*” to remark that there was some trace of deviation from the mathematical equality of the two halves of the skull. Indeed, in *Nicolucci* there occur the words (p. 5), “il teschio offre in questa parte una notevole assimetria”—“il che tieno senza dubbio ad una *sinostosi precoce*.” We may consequently presume upon a real *obliquity of the skull*, and there is no contradiction in the circumstance, that as it appears none of his contemporaries had observed a want of symmetry in the face of the living man, as such inequalities are confessedly easily overlooked. It further seems that here we have a case of that obliquity of skull depending upon one-sided ossification of sutures in early infancy, as made known by Soemmering, Virchow, and others, for there follows at p. 16 the assertion of a one-sided obliteration:—“Le suture della volta craniense non sono cancellate, se non che vedesi una soldatura là dove il parietale destro s’articola coll’ osso occipitale.”

With respect to the obliteration of sutures, which in this skull

occasioned asymmetry, the text of the "Relazione" does not permit me to form a judgment. It says, "the left parietal protuberance was more prominent, and at the same time lay a little more backwards." But the asymmetrical obliteration affected the right half of the lambdoidal suture. Asymmetries, as far as they depend on obliteration of sutures, usually operate otherwise. The backward position of the left parietal tuber commonly depends upon this, that the frontal and parietal tuberosities of the *right* side, in consequence of the obliteration of the limb of the coronal suture lying between them, are not sufficiently separated from one another. An obliteration of the right half of the *sutura lambdoidea* cannot draw the *left* parietal tuber backwards; but it will, on the other hand, bring the right parietal tuberosity nearer to the occipital tuber. However that may be, there occur in the case of wry skulls diverse irregularities, and the obliteration of sutures and their results in older skulls are only with difficulty recognised and estimated.

It appears to me to be of decisive importance that the mask of Dante exhibits a very obvious asymmetry originating in the bones, exactly of that nature which I have often observed where the posterior position of the left parietal tuberosity was dependent on synostosis of sutures.* If we place the mask so that the upper face is directed straight forward, and glance from the forehead of the mask down to the chin, it is very remarkable that the anterior surface of the strong angular chin deviates to the right. The deviation from the true square line amounts at least to from 12 to 15 degrees.

It is singular that the Reporters in their assertion, that the skull and the mask exhibited essentially the same characters, did not make mention of this *obliquity* as a character common to both; but, that this skull, which on many other grounds is probably the skull of Dante, and that the mask, which on many other grounds also is likely to be that of Dante, should both agree in a character so rarely occurring, renders the probability greater that both are genuine.

I find in the "Relazione" no mention that the mask of Dante is awry, neither is it known that the same mask nor Dante's head was formed unsymmetrically. Indeed, a considerable asymmetry of the skull and face may escape a common observer. We assume it has not been known of Dante;† but if a modeller should have undertaken to discover a "death-mask" of the poet, or to have substituted one, how should he happen to make it so strongly unsymmetrical, and in that definite manner which agrees with the skull?

* For example, the skull No. 103 of the Halle collection may be referred to.

† No portrait, as far as I know, indicates it. Boccaccio's very exact report of the bodily proportions of Dante (in *Vita e Costumi di Dante*) knows nothing of a wryness.

However absolutely incompatible the measures taken upon the mask may be with the corresponding dimensions specified in the "Relazione" as those of the skull, it appears to me that in the agreement of the asymmetry of the mask and of the skull, we have a testimony for the genuineness of the cranium found in the chest outweighing this contradiction. And to this may be added another fact. On the opening of the marble urn in which the ashes of Dante were interred, it was found to be empty, with the exception of three phalanges lying at the bottom; and exactly the same bones were wanting, as the Reporters rightly call attention to the fact, in the remains of the skeleton in the chest. The authenticity of the marble urn and its contents is unassailable; and if the contents of the urn and of the chest represent one congruous skeleton, it is as good as certain that the chest contained that which was wanting in the urn—the *bones of Dante*.

2. The "Relazione" gives at page 19 a detailed account of Dante's skull according to the principles of Gall's Phrenology. We hear that the back-head showed the organs of passion, the anterior frontal region, intelligence; the lateral frontal and the parietal regions, "poetry, music, satire, and benevolence;" further, a love of authority, a sense of independence, self-esteem, pride, courage, egotism. The lateral parts of the vault of the cranium indicated circumspection and understanding; the temporal depressions, mechanical talent, drawing, sculpture, architecture; the entire development of the skull, a philosophical spirit.

The phrenological interpretation of a skull is so much the more doubtful an affair, the more intimately the constitution of the mind of the respective man is already known by his life and his works.* Science, in my opinion, still stands too far from a localisation of the actions of the mind in individual working territories of the brain, to venture to bring the talents and powers of a master-spirit into relation with the greater or smaller projection of this or that part of the brain. Even to this day it is not generally recognised, that a surpassing spiritual endowment pre-supposes simply a more largely de-

* In this respect, even accident has many times played its mischievous part. In praise of the beauty and fineness of the skull of Raphael, Goethe could not say enough. Yet later it has come out that this skull (which is found in plaster in different collections, as at Giessen in the Soemmerring museum, "*Cranium gypso effictum summi pictoris Raphael*") is not the true skull, but that it is a very ugly skull, of coarse, rude construction. Concerning the reopening of Raphael's tomb in the year 1833, to which "even professors of surgery and anatomy, which is indeed common, were appointed", compare J. D. Passavant, *Rafael von Urbino*, Leipzig, 1839, i, p. 562. There was a plaster cast taken of Raphael's skull, of which hitherto I cannot obtain any account.

veloped, and consequently *heavier brain*, than a moderate endowment. This leads us to the question of *the size of the brain of Dante*.

In this respect the "Relazione" contains the statement, that the cerebral cavity of the skull found in the chest was filled with grains of rice, and that the weight of the grains consumed in the process amounted to 1,420 *grammes*. Of the specific gravity of the rice there is no mention.

As the fixing the weight of the brain of so richly-endowed and so genial a man as Dante has a great interest for the question touched upon, *Nicolucci* hath sought to reduce the figures given in the "Relazione" into brain-weight. He has obtained out of the 1,420 *grammes* of rice of the Report, p. 63, an internal capacity of the cranium of 1,493 cubic *centimètres*,* and deduced a weight of brain of 1,552 *grammes*; adding that this weight of brain, if it does not reach those of Cuvier and Byron,† yet it exceeds that of the eminent intellectual men brought forward by *Rudolph Wagner*:—Dirichlet with 1,520 *grammes*, Fuchs with 1,499 *grammes*, Gaus with 1,492 *grammes*, Dupuytren with 1,437 *grammes*.

I must here object that a weight of 1,420 *grammes* of rice cannot possibly correspond to a brain weighing 1,552 *grammes*. The volume of the internal capacity of the skull, which *Nicolucci* estimates at 1,493 cubic *centimètres*, is scarcely too little; but when he estimates the weight of the brain at 1,552 *grammes*, it is surely very much too high.

1,420 *grammes* of rice, which I shook together pretty well, gave a volume of 1,630 cubic *centimètres*. When I pressed the same into the measuring-glass closer together, probably closer than it would be shaken into the somewhat fragile skull of Dante, I then obtained a volume of 1,680 cubic *centimètres*,‡ which would still correspond to a greater internal cranial capacity of 87 cubic *centimètres* than *Nicolucci* (reckoning with the specific gravity 0.9512) has deduced from the 1,420 *grammes* of rice of the "Relazione." After this, I at first conjectured that the cavity of the skull might have been *larger*. But

* "Pollici cubici" is obviously a misprint.

† In the case of Byron, I have pointed out that the usual statement "2238 *grammes* of brain" is an impossibility, as the skull proper to this weight of brain would presuppose a head about as large as a tun; a view which *Wagner* afterwards adopted. We do not know what kind of weight the figures quoted for Byron's brain refer to, and it therefore appears to me not justifiable when *Wagner* reduces them to "1807 *grammes*". I think that the amount of the weight of Byron's brain, of which we know nothing certain, should be struck out of the tables.

‡ The specific gravity of rice with the air included between the grains, was in both cases 0.870 and 0.897.

still I have no ground to doubt that the rice used in determining the volume of the cavity of the skull of Dante did not possess the specific gravity assumed by Nicolucci, since the other measurements of the skull communicated in the "Relazione" lead me to *figures expressing the internal capacity of the skull, which deviate little from those calculated by Nicolucci, and are at all times not greater.* Thus the horizontal circumference of the skull is specified at 525 millimètres. With such a circumference (where no abnormal conditions of the skull, which here do not exist, exercise a disturbing influence) agrees with, as I by numerous experiments have shown,* an internal capacity of from 1,350 to 1,570, in the mean 1,470 cubic centimètres. Further, the sum we obtain by adding together the long, broad, and high diameters is 458. From this amount of the three chief diameters of the head, the mean size of the internal capacity to be expected is, according to my observations, 1,460 cubic centimètres. So I do not doubt the correctness of the 1,490 cubic centimètres obtained by Nicolucci. Still the weight of the brain is undoubtedly reckoned too high at 1,550 grammes, as more than 100 cubic centimètres of the internal capacity must be deducted for the membranes of the brain and the blood in the venous sinuses.† The figures of the weight of the brain must, therefore, in all cases, be lower than those expressing the internal capacity of the skull in cubical centimètres.‡ To an internal capacity of 1,490 cubic centimètres there belongs, according to my investigations, a weight of brain of 1,420 grammes, so that I believe 1,420 grammes (and not 1,550 grammes), must be accepted as the probable weight of Dante's brain.

Let us now inquire how this weight of brain stands in the series of weights of the brains of pre-eminently intellectual men known to us, and for this purpose a glance at the following Table will render it distinct.§

* *Untersuchungen über Wachsthum und Bau des Menschlichen Schädels*, s. 37, and taf. xvii, 3.

† In the three cases I have mentioned at s. 33, *op. cit.*, the volume of the dura mater and of the blood contained in its sinuses amounted to 100, 115, and 130 cubic centimètres; in other cases to 200 c. c. and more. Cf. Davis, *Crania Britannica*, p. 224.

‡ In Nicolucci's calculation this appears to be overlooked. This is obvious from p. 6 of his Letter. Internal capacity of the skull = 1493 cubic centimètres; specific gravity of brain 1040. Consequently, weight of the brain 1552 c. c., for $1493 \times 1040 = 1552$.

§ The basis of this table was laid in my former one, by which the commonly accepted position, that the weight of the brain of distinguished or intellectually pre-eminent men is, in the average, greater than the normal mean weight of the brain, was for the first time proved in a more exact manner (cf. *Ueber zwei seltene Difformitäten*, etc., Halle, 1863, p. 14). I have

Out of the brain weights of the twenty-six highly endowed men of the accompanying Table, besides Dante, there results as a mean 1509 *grammes*, a figure which is related to 1390 *grammes*, the average obtained from a very large number of the "brains of commoner men," as 109 to 100, and consequently exceeds the mean nine per centum. We shall not rate it too high if we assume between these numbers (the mean of the common brain, and of the brain organised for higher intellectual manifestations) a difference of ten per cent: since the series of our twenty-six men contains, together with real geniuses and men of great talent, some simply well-endowed heads; whilst the great series of nameless men, which affords the mean of "common increased this table by some later measurements, as well as by the addition of some further statements given by an accurate inquirer, J. Thurnam (*On the Weight of the Brain*, London, 1866).

It might perhaps be objected against my table, that "pre-eminent intellectual endowment" is a somewhat indefinite and wide notion. Notwithstanding, I have not at present determined upon making any division into several sections (as men of intellect, of imagination, of will), because the series seems to me too small for this purpose. Nevertheless, I willingly admit the possibility that the individual members of this table may have excelled by excessive development of very different segments of the brain.

In fifteen brains of our table, distinguished by the addition of *w*, the weight was directly determined by weighing. In five (Schiller, R. Bruce, Weissenbach, v. Mosheim, Spix), marked *h*, I have derived the cyphers for the brain from the circumference of the skull. In 6 (Arnoldi, Doell, v. Rheinwald, Bünger, Heinse, Schubert), marked *c*, it has been reckoned from the internal capacity of the skull determined by grain-corns.

To our table belong the following notes. 1. Cuvier, the renowned naturalist, died at the age of 63 years (Thurnam, *op. cit.*, p. 33). 2. Abercrombie, physician, 64 years (*ib.* p. 33). 3. Arnoldi, professor in Marburg, renowned orientalist, 85 years. 4. Joh. Veit Doell, excellent medalist, of diversified talents, 85 years. 5. v. Rheinwald, man rich in intellect, friend of Soemmerring. 6. Robert Bruce, King of Scotland, 54 years. 7. Schiller, 56 years. 8. Spurzheim, physician, 56 years (Thurnam, p. 33). 9. Bünger, professor of anatomy in Marburg. 10. Prof. Weissenbach, out of the Tyrol, 70 years. 11. Dirichlet, professor of mathematics, 54 years (R. Wagner, *Vorstudien*, i). 12. Count de Morny, statesman, 50 years (Thurnam, p. 34). 13. Dan. Webster, statesman, 70 years (*ib.* 34). 14. Campbell, Lord Chancellor, 80 years (*ib.* p. 34). 15. Fuchs, professor of pathology, 52 years (R. Wagner). 16. Chalmers, celebrated preacher, 67 years (Thurnam, p. 34). 17. Gauss, mathematician, Goettingen, 78 years (R. Wagner). 18. v. Mosheim, theologian, multifarious, very intelligent investigator (skull in Blumenbachian collection). 19. Dupuytren, surgeon, 58 years (Thurnam, p. 34). 20. W. Heinse, author of *Ardinghells*, 57 years. 21. Franz Schubert, composer, 69 years. I have to thank Professor Seligmanns of Vienna, for the measurement of the skull. 22. Whewell, philosopher, 71 years (Thurnam, p. 34). 23. Spix, naturalist, 45 years; skull at München. 24. Hermann, philologue, Goettingen, 51 years (R. Wagner). 25. Tiedemann, physiologist, Heidelberg, 80 years. 26. Hausmann, mineralogist, Goettingen, 77 years (R. Wagner, *Vorst.*, i).

brains," does not consist of pure talentless people. Still more, the mean of the ordinary brain is derived from the brains of four hundred and thirteen men, who were of the age of from twenty to sixty years. The mean time of life of our twenty-six men of talent is *sixty-five years*, at which period of life the weight of the brain usually amounts to only about 1320 *grammes*, i. e., *full fourteen per cent. less than the mean estimate of our six-and-twenty*. So great a difference would scarcely have been expected by those inquirers who already share my view.

Under all circumstances the position of Dante in our Table must appear very remarkable. That the cypher representing the weight of the brain of so eminent a genius exceeds the common average only by a little, appears to stand in strong contradiction to the before-stated position. Among the true geniuses of our Table Dante shows the lowest figure, and the five instances in which smaller cyphers occur are far from being of equal birth.

If we ask for an explanation, I may remind the reader that, as I have shown in another place,* in many highly-endowed and in part truly genial men, who have a small capacity of skull and consequently not a very large brain, *the skull, in consequence of infantile obliteration of sutures, has become contracted*. The skull of *Paracelsus* (so far as the remains of the skeleton preserved in the Sebastian's church at Salzburg, are really genuine) has an internal capacity of only 1250 *centimètres*, which would give a weight of brain equal to 1200 *grammes*. In Philipp Meckel the internal capacity is only 1320 cubic *centimètres*, which represents a brain of 1260 *grammes*; and also the brain of Wilh. von Humboldt stands, without doubt, below the average. Whilst I, according to my observations, may maintain that smallness of skull, so long as it does not rest on a checked development, produced by synostosis, will rarely, if ever be met with, in conjunction with higher intellectual endowments. Still, I also admit, that a brain designed for greater intellectual powers, restrained in its development by the occurrence of contraction of the space of the cavity of the skull, may, without injurious results, be circumscribed to a smaller volume under a limitation of the growth of those tissues which are indifferent to the psyche, and when the tissues especially serving the intellectual functions are spared. Admitting this hypothetical proposition, I might first of all merely maintain the position, *that smallness of brain, which is met with in conjunction with open sutures, is a more unfavourable condition for the intellectual functions, than smallness of brain, which is in conjunction with synostotic con-*

* *Ueber zwei seltene Difformitäten des menschlichen Schädels, und über die Frage nach dem zwischen Hirngroesse und geistiger Begabung bestehenden Wechselverhältnisse*, Halle, 1863, s. 17. Cf. Barnard Davis, *On Synostotic Crania among Aboriginal Races of Man*, 1865, p. 21.

traction of the skull. Now, if the skull and the mask of Dante show symptoms ensuing from a contraction of space in early childhood, according to our positions, the remarkably low figure representing the weight of Dante's brain obtains a sufficient explanation.

The inquiry embraced in this letter, as no one mistakes less than the writer, has had to contend with several difficulties, chiefly from this cause, that *the skull of Dante*, its peculiar subject, or the best substitutes, a mould of it, is wholly wanting. And this cast is wanting because anthropological science, however great the progress it may have made in the last few years, has still not acquired in all places the estimation due to it. When the injuries which the precipitate attempts of phrenology, certain hypothetical doctrines of natural philosophy, and a more trifling and playful mode of treatment have occasioned our science, shall be completely dissipated, when people more generally learn to understand that to undertake the study of the whole natural history of *man*, is at least as valuable and important, even where it brings no uses serving any direct so-called practical purpose of common necessity, as the study of snails, plant-lice, crabs, then shall we no longer have to complain that the psychologically interesting remains of our great dead can only be employed clandestinely, and so far as a lucky accident brings them to daylight for our investigations. Then it will not be regarded as a desecration to open graves, and an investigation, under all circumstances difficult, will not then be rendered still more difficult by depriving it of the necessary materials for study.

Always your most devoted,

H. WELCKER.

Halle, July 30th, 1866.

The distinguished anatomist who has honoured me by addressing to me the preceding Letter, has expressed a wish that I should add some Notes to it from the *Memoir* of Professor Gaddi mentioned above, as this *Memoir* did not fall into his hands until this Letter was written. I do not see any important fact in Dr. Gaddi's *Memoir* that bears upon the ingenious line of argument of Professor Welcker which he has not already introduced from the "Relazione" of the Commissioners. Professor Gaddi was already struck with the extraordinary height of 85 *millimètres*, attributed by the Reporters to the upper face, which, he says, in long faces amounts only to 71 *mm.* But he regards this comparative observation as sufficient of itself to demonstrate that these were the bones of Dante, as he is always represented with an extremely long face—a special conformation—which passes as conventional among artists. He also remarks upon

the inordinate distance between the two extreme margins of the orbits, said in the "Relazione" to be 124 *millimètres*, usually only 103 *mm.*; and concludes that the eyes of Dante were placed at a great distance from one another, which Professor Gaddi attributes to the considerable development in breadth of the middle frontal region. The other measurements of the *calvarium*, for such is the skull of Dante, the lower jaw being absent, are regarded by Professor Gaddi as, for a like reason, to exceed the ordinary dimensions of human skulls. He notices the precocious obliteration of the right parieto-occipital suture, and attributes the want of symmetry in the two sides of the calvarium to this as its cause.

The deductions Professor Gaddi obtains from the statements of the "Relazione" and his own comparisons, are these: That the head of Dante Alighieri, is, 1. dolichocephalic; 2. eminently orthognathous; 3. offers great development in the frontal, inter-parietal, and superior occipital regions; and 4. belongs preeminently to the *frontal races* of Gratiolet.

These results are supported at some length, and the eminent anatomist concludes thus:—

"From this combination of facts the encephalon of this amazing genius has had a great volume of the cerebral hemispheres, signally in the anterior and middle segments, and also a conspicuous predominance of the cerebellum. If to these facts we should add that which is known to the entire world of all the incomparable mental faculties exercised by him in his life-time, we shall be constrained to conjecture that the cerebral hemispheres of Dante will have been certainly provided with a great number of convolutions, with anfractuositities very profound, and consequently with a spacious superficies for action. The noted prominence situated longitudinally upon the middle superior part of the frontal bone, gives reason for the *Theosophia* which always shines through in his immortal writings," p. 18.

With respect to the stock from which Dante, who regarded himself to have been of Roman origin, was descended, Professor Gaddi quotes a passage from Dr. Nicolucci, who decides with confidence that he was not Roman, but Tuscan by birth and descent.

The most generally interesting portion of the *Memoir* addressed by Professor Gaddi to the President of the Royal Academy of Sciences, Letters and Arts of Modena, is probably that in which he exhibits such striking zeal to have secured that thorough anatomical investigation of the remains of the great Italian poet, which all must now lament was not instituted when these relics were brought to the light of day.

Convinced of the great value of anthropology, and regarding ethnographic and anthropological studies as signally based upon the confor-

mation of the cranium, which, he says, is that part of the human skeleton upon which nature has impressed indelible and constant characters, he early addressed (June 3, 1864) a respectful letter to the municipality of Ravenna, offering his services to search for the venerable remains and to give a scientific description of them. He received a tardy reply from the municipality, informing him that there was no intention whatever to open the urn which contained the bones of Dante, and that the profane hand of man could not, without offence, approach its interior. This was in July 1864. The bones of Dante, which had been removed from the chest at a remote period, were found in the wall of the chapel of Braccio Forte, on the 27th May, 1865, which took away all idea of profanation. He pointedly inquires why, if the municipality had not confidence in him, did they not apply to other competent persons, and above all to the illustrious ethnograph Nicolucci? At this latter time a Government Commission was created by the Minister for Public Instruction, which did not include the name of Nicolucci or of Gaddi, for the purpose of identifying the remains. Among the instructions given to this Commission was that of especially examining the cranium to see if it corresponded to those portraits which are considered to be most authentic, and *to institute upon it those phrenological investigations which science suggests.*

Professor Gaddi, with great justice, feelingly laments that so precious an opportunity should have been lost, that his ardent desires should have been frustrated, and that he should have been prevented from obtaining the materials necessary for producing a *Memoir* for the Acts of the Royal Academy of Sciences of Modena, which, from its subject, would have thrown lustre on the Academy itself.

J. B. D.

ON THE VALUE OF PHRENOLOGY IN ANTHROPOLOGICAL INVESTIGATIONS.*

By J. W. JACKSON, Esq., F.A.S.L.

As a Member of the Phrenological Association of Edinburgh, and a Fellow of the Anthropological Society of London, I have long felt that phrenologists, devoted to their own speciality, are, as a body, unwisely indifferent to the wider field of anthropology; while conversely, anthropologists, occupied with their grander facts and larger area, are

* This is a report of a speech delivered at the anniversary meeting of the Edinburgh Phrenological Association, on October 24th, 1866.